



6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 141

[EPA-HQ-OW-2012-0288; FRL-9693-4]

Expedited Approval of Alternative Test Procedures for the Analysis of Contaminants Under the Safe Drinking Water Act; Analysis and Sampling Procedures

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final Rule.

SUMMARY: This action announces the U.S. Environmental Protection Agency's (EPA's) approval of alternative testing methods for use in measuring the levels of contaminants in drinking water and determining compliance with national primary drinking water regulations. The Safe Drinking Water Act (SDWA) authorizes EPA to approve the use of alternative testing methods through publication in the *Federal Register*. EPA is using this streamlined authority to make 10 additional methods available for analyzing drinking water samples required by regulation. This expedited approach provides public water systems, laboratories, and primacy agencies with more timely access to new measurement techniques and greater flexibility in the selection of analytical methods, thereby reducing monitoring costs while maintaining public

health protection.

DATES: This action is effective [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER].

FOR FURTHER INFORMATION CONTACT: Safe Drinking Water Hotline (800) 426-4791 or Glynda Smith, Technical Support Center, Standards and Risk Management Division, Office of Ground Water and Drinking Water (MS 140), Environmental Protection Agency, 26 West Martin Luther King Drive, Cincinnati, OH 45268; telephone number: (513) 569-7652; e-mail address: smith.glynda@epa.gov.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this Action Apply to Me?

Public water systems are the regulated entities required to measure contaminants in drinking water samples. In addition, EPA Regions as well as States and Tribal governments with authority to administer the regulatory program for public water systems under SDWA may also measure contaminants in water samples. When EPA sets a monitoring requirement in its national primary drinking water regulations for a given contaminant, the Agency also establishes in the regulations standardized test procedures for analysis of the contaminant. This action

makes alternative testing methods available for particular drinking water contaminants beyond the testing methods currently established in the regulations. EPA is providing public water systems required to test water samples with a choice of using either a test procedure already established in the existing regulations or an alternative test procedure that has been approved in this action or in prior expedited approval actions. Categories and entities that may ultimately be affected by this action include:

Category	Examples of potentially regulated entities	NAICS ¹
State, Local, & Tribal Governments	States, local and Tribal governments that analyze water samples on behalf of public water systems required to conduct such analysis; States, local and Tribal governments that themselves operate community and non-transient non-community water systems required to monitor.	924110
Industry	Private operators of community and non-transient non-community water systems required to monitor.	221310
Municipalities	Municipal operators of community and non-transient non-community water systems required to monitor.	924110

¹North American Industry Classification System.

This table is not exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this action. This table lists the types of entities that EPA is now aware could potentially be affected by this action. Other types of entities not listed in the table could also be impacted. To determine whether your facility is affected by this action, you should carefully examine the applicability language in the *Code of Federal Regulations* (CFR) at 40 CFR 141.2 (definition of public water system). If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding "FOR FURTHER INFORMATION CONTACT" section.

B. *How Can I Get Copies of This Document and Other Related Information?*

Docket. EPA established a docket for this action under Docket ID No. EPA-HQ-OW-2012-0288. Publicly available docket materials are available either electronically through www.regulations.gov or in hard copy at the Water Docket in the EPA Docket Center, (EPA/DC) EPA West, Room 3334, 1301 Constitution Ave., NW, Washington, DC. Copyrighted materials are available only in hard copy. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Water Docket is (202) 566-2426.

Abbreviations and Acronyms Used in this Action

ANOVA: Analysis of Variance

APHA: American Public Health Association

CAS: Chemical Abstracts Service

CFR: *Code of Federal Regulations*

DIC: Differential Interference Contrast

EDTA: Ethylenediaminetetraacetic Acid

EPA: Environmental Protection Agency

FA: Fluorescence Assay

GC/MS: Gas Chromatography/Mass Spectrometry

HCCPD: Hexachlorocyclopentadiene

IMS: Immunomagnetic Separation

LC-MS/MS: Liquid Chromatography Tandem Mass Spectrometry

MCL: Maximum Contaminant Level

NaHMP: Sodium Hexametaphosphate

NAICS: North American Industry Classification System

NEMI: National Environmental Methods Index

PCB: Polychlorinated Biphenyl

QC: Quality Control

SDWA: Safe Drinking Water Act

VCSB: Voluntary Consensus Standard Bodies

II. Background

A. What is the Purpose of This Action?

In this action, EPA is approving 10 analytical methods for determining contaminant concentrations in samples collected under SDWA. Regulated parties required to sample and monitor may use either the testing methods already established in existing regulations or the alternative testing methods being approved in this action or in prior expedited approval actions. The new methods are listed along with other previously expedited methods in Appendix A to Subpart C of Part 141 and on EPA's drinking water methods Web site at http://water.epa.gov/scitech/drinkingwater/labcert/analyticalmethods_expedited.cfm .

B. What is the Basis for This Action?

When EPA determines that an alternative analytical method is “equally effective” (i.e., as effective as a method that has already been promulgated in the regulations), SDWA allows EPA to approve the use of the alternative method through publication in the *Federal Register*. (See Section 1401(1) of SDWA.) EPA is using this streamlined approval authority to make 10 additional methods available for determining contaminant concentrations in samples collected under the SDWA. EPA has determined that, for each contaminant or group of contaminants listed in Section III, the additional testing methods being approved in this action are as effective as one or more of the testing methods already approved in the regulations for those contaminants. Section 1401(1) of SDWA states that the newly approved methods “shall be treated as an alternative for public water systems to the quality control and testing procedures listed in the regulation.” Accordingly, this action makes these additional 10 analytical methods legally available as options for meeting EPA’s monitoring requirements.

This action does not add regulatory language, but does, for informational purposes, update an appendix to the regulations at 40 CFR Part 141 that lists all methods approved under Section 1401(1) of SDWA. Accordingly, while this action is not a rule, it is updating CFR text and therefore is being published in the “Final Rules” section of the *Federal Register*.

III. Summary of Approvals

EPA is approving 10 methods that are equally effective relative to methods previously promulgated in the regulations. By means of this notice, these 10 methods are added to Appendix A to Subpart C of 40 CFR Part 141.

A. Methods developed by EPA

1. EPA Method 536 (USEPA 2007) is a direct injection liquid chromatography tandem mass spectrometry (LC-MS/MS) method for the determination of atrazine and simazine, which are regulated in drinking water as specified at 40 CFR 141.61(c). The analytes are separated and identified by comparing the retention times and acquired mass spectra to the retention times and reference spectra for calibration standards acquired under identical LC-MS/MS conditions. The concentration of each analyte is determined by internal standard calibration using procedural standards. EPA Method 536 simplifies sample preparation because it does not require labor-intensive clean-up or pre-concentration using solid phase extraction. It also provides laboratories with the opportunity to use liquid chromatography for the analytical separation instead of gas chromatography, which is used in the approved methods for the determination of atrazine and simazine.

The currently approved methods for monitoring atrazine and simazine in drinking water are listed at 40 CFR 141.24(e)(1). EPA Method 525.2, Revision 2.0 (USEPA 1995) is the only approved method that employs mass spectrometry for detection of atrazine and simazine. Therefore, the method performance characteristics of EPA Method 536 were compared to the characteristics of EPA Method 525.2, Revision 2.0 for both atrazine and simazine. EPA has found that EPA Method 536 is equally effective for measuring atrazine and simazine concentrations in drinking water, relative to the approved method. The basis for this determination is discussed in Smith and Wendelken (2012a). Therefore, EPA is approving EPA Method 536 for determining atrazine and simazine in drinking water.

A copy of EPA Method 536 can be accessed and downloaded directly on-line at <http://water.epa.gov/drink>.

2. EPA Method 523 (USEPA 2011) is a gas chromatography mass spectrometry (GC/MS) method for the determination of atrazine and simazine, which are regulated in drinking water as specified at 40 CFR 141.61(c). The method analytes are extracted and concentrated from the water sample using solid phase extraction. Extracts are injected onto a capillary GC column and analyzed with a mass spectrometer. The method analytes are identified by comparing retention times and the acquired mass spectra to retention times and reference spectra for calibration standards acquired under identical GC/MS conditions. The concentration of each analyte is determined using the internal standard technique.

As discussed with EPA Method 536, EPA Method 523 can be used for the determination of atrazine and simazine in finished drinking water. EPA Method 523 and the approved EPA Method 525.2, Revision 2.0 (USEPA 1995) are both GC/MS methods; however, one of the advantages that EPA Method 523 offers relative to the approved method is the use of solid reagents, ammonium acetate and 2-chloroacetamide, for sample preservation instead of hydrochloric acid. This allows sample bottles to be prepared in the laboratory prior to shipment to the field, thus eliminating the need to ship a hazardous liquid acid. The method performance characteristics of EPA Method 523 were compared to the characteristics of the approved EPA Method 525.2, Revision 2.0 for atrazine and simazine. EPA has found that EPA Method 523 is equally effective for measuring atrazine and simazine concentrations, relative to the approved method. The basis for this determination is discussed in Smith and Wendelken (2012a). Therefore, EPA is approving EPA Method 523 for determining atrazine and simazine in drinking water.

A copy of EPA Method 523 can be accessed and downloaded directly on-line at <http://water.epa.gov/drink>.

3. EPA Method 525.3 (USEPA 2012) is a GC/MS method for the determination of semivolatile organic compounds in finished drinking water. The method analytes are extracted and concentrated from the water sample using solid phase extraction. Extracts are injected onto a capillary GC column and analyzed using mass spectrometry. The analytes are identified by comparing retention times and the acquired mass spectra to retention times and reference spectra for calibration standards acquired under identical GC/MS conditions. The concentration of each analyte is determined using the internal standard technique.

EPA Method 525.3 is a revision of EPA Method 525.2, Revision 2.0 (USEPA 1995) which is currently approved at 40 CFR 141.24(e)(1) for analysis of drinking water compliance samples for 17 semivolatile organic contaminants: alachlor, atrazine, polychlorinated biphenyls (PCBs), benzo[a]pyrene, chlordane, di(2-ethylhexyl) adipate, di(2-ethylhexyl) phthalate, endrin, lindane (HCH- γ), heptachlor, heptachlor epoxide, hexachlorobenzene, hexachlorocyclopentadiene (HCCPD), methoxychlor, pentachlorophenol, simazine, and toxaphene. It should be noted that for PCBs, the approved method can only be used as a screen; compliance with the PCB maximum contaminant level (MCL) is based on quantitative analysis using EPA Method 508A (USEPA 1989) as specified at 40 CFR 141.24(h)(13)(iii). Likewise, EPA Method 525.3 can only be used for PCBs as a screen. Some of the advantages afforded by the revised method include:

- Use of solid preservation reagents (ascorbic acid, ethylenediaminetetraacetic acid (EDTA), and potassium dihydrogen citrate), which eliminates the requirement to ship liquid hydrochloric acid to the field;

- Incorporation of flexibility that allows analysts to take advantage of multiple types of solid phase extraction media and GC/MS instrumentation options to improve method sensitivity and data quality; and
- Improved guidance for handling the data reduction associated with multi-component contaminants such as toxaphene, chlordane, and PCBs.

The method performance characteristics of EPA Method 525.3 were compared to the characteristics of the approved EPA Method 525.2, Revision 2.0 for each of the 17 regulated semivolatile organic contaminants. EPA has determined that EPA Method 525.3 is equally effective for measuring each of these 17 contaminants relative to the approved method. The basis for this determination is discussed in Munch, Grimmer and Smith (2012). EPA is therefore approving the use of Method 525.3 for the above named 17 contaminants when analyzing drinking water compliance samples.

A copy of EPA Method 525.3 can be accessed and downloaded directly on-line at <http://www.epa.gov/nerlcwww/ordmeth.htm>.

4. EPA Method 1623.1 (USEPA 2012) is a microbiological method for the detection of the water-borne parasite, *Cryptosporidium* (CAS Registry Number 137259-50-8), in drinking water treatment plant source waters by concentration, immunomagnetic separation (IMS), and immunofluorescence assay microscopy. *Cryptosporidium* is characterized using 4',6-diamidino-2-phenylindole staining and differential interference contrast (DIC) microscopy. *Cryptosporidium* concentrations are reported as oocysts/L.

EPA Method 1623.1 is a revision of EPA Method 1623 (USEPA 2005), which is approved at 40 CFR 141.704(a) for the detection of *Cryptosporidium* in water. The primary change in EPA Method 1623.1 relative to the approved method is the addition of sodium

hexametaphosphate (NaHMP) after filtration of the water sample. Miller (2012a) describes two EPA studies that showed improved accuracy and precision for detecting the concentration of *Cryptosporidium* oocysts in water when NaHMP was added: (1) a single laboratory side-by-side analysis that compared samples from nine public water system sources processed by both EPA Method 1623 and EPA Method 1623.1, and showed an average *Cryptosporidium* recovery improvement of 18 percentage points ($p = 0.0001$); and (2) a multi-laboratory side-by-side analysis that resulted in an average *Cryptosporidium* recovery improvement of 15 percentage points with the addition of NaHMP for the three source waters that were tested ($p = 0.0197$). The more significant improvement in *Cryptosporidium* recovery during the side-by-side studies was particularly associated with samples that had low initial recovery using Method 1623.

Miller (2012b) contains the study report that details the validation of EPA Method 1623.1. Fourteen laboratories demonstrated a mean *Cryptosporidium* recovery from source water of 61% with an average within-laboratory relative standard deviation of 13%. The precision and recovery for EPA Method 1623.1 were compared to the precision and recovery observed in the validation study for the approved EPA Method 1623. The *Cryptosporidium* reagent water and source water mean percent recoveries for EPA Method 1623.1 are at least 20 percentage points higher than the recoveries cited in the validation study for EPA Method 1623. In addition, the mean relative standard deviation for *Cryptosporidium* measurements was lower in both matrices for the revised EPA Method 1623.1 demonstrating improved precision.

The data from the EPA Method 1623.1 validation studies were used to develop new quality control (QC) criteria for laboratory performance. For each QC criterion, the distribution of recovery was estimated using random effects analysis of variance (ANOVA). The recovery limits were estimated at the 5th percentile of the predictive distribution for each criterion. The

lower limit for acceptable recovery of *Cryptosporidium* detected in reagent and source water increased by 22 and 19 percentage points, respectively, over EPA Method 1623 criteria. Thus, laboratories performing EPA Method 1623.1 should have more accurate detection and will be meeting more stringent QC criteria than laboratories following Method 1623.

Based on the validation results, EPA has determined that EPA Method 1623.1 is equally effective for detecting *Cryptosporidium* oocysts, relative to the approved method. Therefore, EPA is approving EPA Method 1623.1 for detecting *Cryptosporidium* in drinking water source waters. A copy of EPA Method 1623.1 can be accessed and downloaded directly on-line at <http://water.epa.gov/drink>.

B. *Methods developed by Voluntary Consensus Standard Bodies (VCSB)*

1. Standard Methods for the Examination of Water and Wastewater (Standard Methods). EPA compared the most recent versions of two Standard Methods to earlier versions of those methods that are currently approved in 40 CFR Part 141. Changes between the earlier approved version and the most recent version of each method are summarized in Smith (2012). The revisions primarily involve editorial changes (e.g., corrections of errors, procedural clarifications, and reorganization of text). The revised methods are the same as the earlier approved versions with respect to the chemistry, sample handling protocols, and method performance data. The new versions are thus equally effective relative to those that are currently approved in the regulations. Therefore, EPA is approving the use of the two updated Standard Methods for the contaminants and their respective regulations listed in the following table:

Standard Method	Approved Method	Contaminant	Regulation
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Revised Version			
3125, 21 st edition (APHA 2005)	3125, 20 th edition (APHA 1998)	Uranium	40 CFR 141.25(a)
3112 B-09, on-line version (APHA 2009)	3112 B-99, on-line version (APHA 1999)	Mercury	40 CFR 141.23(k)(1)

The 21st edition can be obtained from the American Public Health Association (APHA), 800 I Street, NW, Washington, DC 20001-3710. Online versions of Standard Methods are available at <http://www.standardmethods.org>.

2. ASTM International. EPA compared the most recent versions of three ASTM International methods (ASTM Methods D859-10, D1179-10 B, and D5673-10) to the earlier versions of those methods that are currently approved in 40 CFR 141. Changes between the earlier approved version and the most recent version of each method are summarized in Smith (2012). The revisions primarily involve editorial changes (e.g., updated references, definitions, terminology, and reorganization of text). The revised methods are the same as the approved versions with respect to sample collection and handling protocols, sample preparation, analytical methodology, and method performance data, and thus, are equally effective relative to the approved methods.

An additional ASTM Method, D6239-09, was submitted for evaluation as an alternate test method to EPA Method 908.0 (USEPA 1980) for the analysis of uranium in drinking water. ASTM Method D6329-09 involves the analysis of uranium in drinking water by alpha scintillation with pulse shape discrimination. This technique offers high alpha counting efficiency since the electronic pulse shape discrimination reduces background counts associated with beta-gamma interference. ASTM Method D6239-09 incorporates selective solvent

extraction to separate and concentrate uranium from drinking water samples for subsequent alpha liquid scintillation counting. With pulse shape discrimination, the method provides sufficient resolution to yield limited isotopic activity levels for uranium-238 and uranium-234 as well as total uranium activity. EPA Method 908.0, which relies on co-precipitation of uranium with iron hydroxide followed by ion exchange separation to isolate uranium, is not capable of distinguishing among the uranium radioisotopes. The approved methods for uranium are listed at 40 CFR 141.25(a). The performance characteristics of ASTM Method D6239-09 were compared to the performance characteristics of the approved method, EPA Method 908.0. Smith and Wendelken (2012b) summarizes the research and validation data associated with development of ASTM Method D6239-09. EPA has determined that ASTM Method D6239-09 is equally effective, relative to EPA Method 908.0, for the determination of total uranium activity in drinking water.

EPA is thus approving the use of the following ASTM methods for the contaminants and their respective regulations listed in the following table:

ASTM Revised Version	Approved Method	Contaminant	Regulation
D859-10 (ASTM 2010a)	D859-00 (ASTM 2000)	Silica	40 CFR 141.23(k)(1)
D1179-10 B (ASTM 2010b)	D1179-99 B (ASTM 1999)	Fluoride	40 CFR 141.23(k)(1)
D5673-10 (ASTM 2010c)	D5673-03 (ASTM 2003)	Uranium	40 CFR 141.25(a)
D6239-09 (ASTM 2009)	EPA Method 908.0	Uranium	40 CFR 141.25(a)

The ASTM methods are available from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or <http://www.astm.org>.

IV. Statutory and Executive Order Reviews

As noted in Section II, under the terms of SDWA Section 1401(1), this streamlined method approval action is not a rule. Accordingly, the Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, does not apply because this action is not a rule for purposes of 5 U.S.C. 804(3). Similarly, this action is not subject to the Regulatory Flexibility Act because it is not subject to notice and comment requirements under the Administrative Procedure Act or any other statute. In addition, because this approval action is not a rule but simply makes alternative testing methods available as options for monitoring under SDWA, EPA has concluded that other statutes and executive orders generally applicable to rulemaking do not apply to this approval action.

V. References

American Public Health Association (APHA). 1998. *20th Edition of Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

American Public Health Association (APHA). 1999. Standard Method 3112 B-99. Metals by Cold-Vapor Atomic Absorption Spectrometry. Approved by Standard Methods Committee 1999. Standard Methods Online. (Available at <http://www.standardmethods.org>.)

American Public Health Association (APHA). 2005. *21st Edition of Standard Methods for the*

Examination of Water and Wastewater, American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

American Public Health Association (APHA). 2009. Standard Method 3112 B-09. Metals by Cold-Vapor Atomic Absorption Spectrometry. Approved by Standard Methods Committee 2009. Standard Methods Online. (Available at <http://www.standardmethods.org>.)

ASTM International. 1999. ASTM D1179-99 B. Standard Test Methods for Fluoride Ion in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at <http://www.astm.org>.)

ASTM International. 2000. ASTM D859-00. Standard Test Method for Silica in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at <http://www.astm.org>.)

ASTM International. 2003. ASTM D5673-03. Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at <http://www.astm.org>.)

ASTM International. 2009. ASTM D6239-09. Standard Test Method for Uranium in Drinking Water by High-Resolution Alpha-Liquid-Scintillation Spectrometry. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at <http://www.astm.org>.)

ASTM International. 2010a. ASTM D859-10. Standard Test Method for Silica in Water.

ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at <http://www.astm.org>.)

ASTM International. 2010b. ASTM D1179-10 B. Standard Test Methods for Fluoride Ion in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at <http://www.astm.org>.)

ASTM International. 2010c. ASTM D5673-10. Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at <http://www.astm.org>.)

Miller, C. 2012a. Memo to the record describing basis for expedited approval of EPA Method 1623.1. January 20, 2012.

Miller, C. 2012b. Method 1623.1 validation study report, “Results of the Inter-laboratory Method Validation Study using U.S. Environmental Protection Agency Method 1623.1: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/FA,” EPA 816-R-12-002, February 2012.

Munch, J., Grimmett, P., and Smith, G. 2012. Memo to the record describing basis for expedited approval of EPA Method 525.3. January 23, 2012.

Smith, G. 2012. Memo to the record describing basis for expedited approval of updated methods from Standard Methods and ASTM International. January 19, 2012.

Smith, G. and Wendelken, S. 2012a. Memo to the record describing basis for expedited approval of EPA Methods 523 and 536. January 20, 2012.

Smith, G. and Wendelken, S. 2012b. Memo to the record describing ATP evaluation of ASTM Method D6239-09 and basis for expedited approval. January 20, 2012.

USEPA. 1980. EPA Method 908.0, “Uranium in Drinking Water – Radiochemical Method 908.0” in Prescribed Procedures for the Measurement of Radioactivity in Drinking Water, EPA 600/4-80-032, August 1980. (Available at the U.S. Department of Commerce, National Technical Information Service (NTIS), 5301 Shawnee Road, Alexandria, VA 22312 (703-605-6040). PB 80-224744. <http://www.ntis.gov>.)

USEPA. 1989. EPA Method 508A, Revision 1.0, “Screening for Polychlorinated Biphenyls by Perchlorination and Gas Chromatography” in Methods for the Determination of Organic Compounds in Drinking Water, EPA/600/4-88-039, December 1988 (Revised July 1991). (Available at <https://www.nemi.gov>.)

USEPA. 1995. EPA Method 525.2, Revision 2.0, “Determination of Organic Compounds in Drinking Water by Liquid-Solid Extraction and Capillary Column Gas Chromatography/Mass Spectrometry” in Methods for the Determination of Organic Compounds in Drinking Water,

Supplement III, EPA/600/R-95-131, August 1995. (Available at <https://www.nemi.gov>.)

USEPA. 2005. EPA Method 1623, “*Cryptosporidium* and *Giardia* in Water by Filtration/IMS/FA”, EPA-815-R-05-002. December 2005. (Available at <http://www.epa.gov/nerlcwww/online.html>.)

USEPA. 2007. EPA Method 536, “Determination of Triazine Pesticides and their Degradates in Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)”, EPA-815-B-07-002. October 2007. (Available at <http://water.epa.gov/drink>.)

USEPA. 2011. EPA Method 523, “Determination of Triazine Pesticides and their Degradates in Drinking Water by Gas Chromatography/Mass Spectrometry (GC/MS)”, EPA-815-R-11-002. February 2011. (Available at <http://water.epa.gov/drink>.)

USEPA. 2012. EPA Method 525.3, “Determination of Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/Mass Spectrometry (GC/MS)”, EPA/600/R-12/010. February 2012. (Available at <http://www.epa.gov/nerlcwww/ordmeth.htm>.)

USEPA. 2012. EPA Method 1623.1. “*Cryptosporidium* and *Giardia* in Water by Filtration/IMS/FA”, EPA-816-R-12-001. January 2012. (Available at <http://water.epa.gov/drink>.)

List of Subjects in 40 CFR Part 141

Environmental protection, Chemicals, Indians-lands, Intergovernmental relations,
Radiation protection, Reporting and recordkeeping requirements, Water supply.

Dated: June 21, 2012

Pamela S. Barr,

Acting Director, Office of Ground Water and Drinking Water.

For the reasons stated in the preamble, 40 CFR Part 141 is amended as follows:

PART 141 - NATIONAL PRIMARY DRINKING WATER REGULATIONS

1. The authority citation for Part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300j-4, and 300j-9.

2. Appendix A to Subpart C of Part 141 is amended as follows:

a. By revising entries for “Fluoride,” “Mercury,” and “Silica” in the table entitled

“Alternative testing methods for contaminants listed at 40 CFR 141.23(k)(1).”

- b. By adding entries for “Alachlor,” “Atrazine,” and “Benzo(a)pyrene” after the entry for “2,4,5-TP (Silvex)” in the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.24(e)(1)”
- c. By adding the entry for “Chlordane” after the entry for “Carbofuran” in the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.24(e)(1).”
- d. By adding entries for “Di(2-ethylhexyl)adipate” and “Di(2-ethylhexyl)phthalate” after the entry for “Dalapon” in the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.24(e)(1).”
- e. By adding the entry for “Endrin” after the entry for “Dinoseb” in the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.24(e)(1).”
- f. By adding entries for “Heptachlor,” “Heptachlor Epoxide,” “Hexachlorobenzene,” “Hexachlorocyclopentadiene,” “Lindane,” and “Methoxychlor” after the entry for “Glyphosate” in the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.24(e)(1).”
- g. By adding the entry for “PCBs (as Aroclors)” after the entry for “Oxamyl” in the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.24(e)(1).”
- h. By revising the entry for “Pentachlorophenol” in the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.24(e)(1).”

- i. By adding entries for “Simazine” and “Toxaphene” after the entry for “Picloram” in the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.24(e)(1).”
- j. By revising the entry for “Uranium” in the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.25(a).”
- k. By adding the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.704(a)” after the table entitled “Alternative testing methods for contaminants listed at 40 CFR 141.402(c)(2).”

The additions and revisions read as follows:

Appendix A to Subpart C of Part 141 - Alternative Testing Methods Approved for Analyses Under the Safe Drinking Water Act.

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Alternative Testing Methods for Contaminants Listed at 40 CFR 141.23(k)(1)						
Contaminant	Methodology	EPA Method	SM 21st Edition¹	SM Online₃	ASTM⁴	Other
* * * * *						
Fluoride	Ion Chromatography		4110 B			
	Manual Distillation; Colorimetric SPADNS		4500-F ⁻ B, D			
	Manual Electrode		4500-F ⁻ C		D 1179-04, 10 B	
	Automated Alizarin		4500-F ⁻ E			
	Arsenite-Free Colorimetric SPADNS					Hach SPADNS 2 Method 10225 ²²
* * * * *						
Mercury	Manual, Cold Vapor		3112 B	3112 B-09		
* * * * *						
Silica	Colorimetric				D859-05, 10	
	Molybdosilicate		4500-SiO ₂ C			
	Heteropoly blue		4500-SiO ₂ D			

	Automated for Molybdate-reactive Silica		4500-SiO ₂ E			
	Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES)	200.5, Revision 4.2 ²				
	Inductively Coupled Plasma		3120 B			
* * * * *						

Alternative Testing Methods for Contaminants Listed at 40 CFR 141.24(e)(1)				
Contaminant	Methodology	EPA Method	SM 21 st Edition ¹	SM Online ³
* * * * *				
Alachlor	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
Atrazine	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴ , 523 ²⁶		
	Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)	536 ²⁵		
Benzo(a)pyrene	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
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Chlordane	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
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Di(2-ethylhexyl)adipate	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		

Alternative Testing Methods for Contaminants Listed at 40 CFR 141.24(e)(1)				
Contaminant	Methodology	EPA Method	SM 21st Edition¹	SM Online³
Di(2-ethylhexyl)phthalate	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
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Endrin	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
* * * * *				
Heptachlor	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
Heptachlor Epoxide	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
Hexachlorobenzene	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
Hexachlorocyclopentadiene	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
Lindane	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
Methoxychlor	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
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PCBs (as Aroclors)	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
Pentachlorophenol	Gas Chromatography/Electron Capture Detection (GC/ECD)		6640 B	6640 B-01
	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
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Alternative Testing Methods for Contaminants Listed at 40 CFR 141.24(e)(1)				
Contaminant	Methodology	EPA Method	SM 21 st Edition ¹	SM Online ³
Simazine	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴ , 523 ²⁶		
	Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)	536 ²⁵		
Toxaphene	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 ²⁴		
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Alternative Testing Methods for Contaminants Listed at 40 CFR 141.25(a)			
Contaminant	Methodology	SM 21 st Edition ¹	ASTM ⁴
Naturally Occurring:			
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Uranium	Radiochemical	7500-U B	
	ICP-MS	3125	D5673-05,10
	Alpha spectrometry	7500-U C	D3972-09
	Laser Phosphorimetry		D5174-07
	Alpha Liquid Scintillation Spectrometry		D6239-09
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Alternative Testing Methods for Contaminants Listed at 40 CFR 141.704(a)		
Organism	Methodology	EPA Method
<i>Cryptosporidium</i>	Filtration/Immunomagnetic Separation/Immunofluorescence Assay	1623.1 ²⁷

	Microscopy	
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¹ Standard Methods for the Examination of Water and Wastewater, 21st edition (2005). Available from American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

² EPA Method 200.5, Revision 4.2. “Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry.” 2003. EPA/600/R-06/115. (Available at <http://www.epa.gov/nerlcwww/ordmeth.htm>.)

³ Standard Methods Online are available at <http://www.standardmethods.org>. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

⁴ Available from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or <http://astm.org>. The methods listed are the only alternative versions that may be used.

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²² Hach Company Method, “Hach Company SPADNS 2 (Arsenic-free) Fluoride Method 10225 – Spectrophotometric Measurement of Fluoride in Water and Wastewater,” January 2011. 5600 Lindbergh Drive, P.O. Box 389, Loveland, Colorado 80539. (Available at <http://www.hach.com>.)

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²⁴ EPA Method 525.3. “Determination of Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatograph/Mass Spectrometry (GC/MS).” 2012. EPA/600/R-12/010. (Available at <http://www.epa.gov/nerlcwww/ordmeth.htm>.)

²⁵ EPA Method 536. “Determination of Triazine Pesticides and their Degradates in Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS).” 2007. EPA-815-B-07-002. (Available at <http://water.epa.gov/drink>.)

²⁶ EPA Method 523. “Determination of Triazine Pesticides and their Degradates in Drinking Water by Gas Chromatography/Mass Spectrometry (GC/MS).” 2011. EPA-815-R-11-002. (Available at <http://water.epa.gov/drink>.)

²⁷ EPA Method 1623.1. “*Cryptosporidium* and *Giardia* in Water by Filtration/IMS/FA.” 2012. EPA-816-R-12-001. (Available at <http://water.epa.gov/drink>.)

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